The Future of the New Economy

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The increase in productivity growth rates beginning in the mid-1990s has helped boost economic growth and speed the rate at which living standards rise in the United States. Between 1995 and 2000, productivity growth averaged 2.8%--almost double the rate during the preceding 22 years! This increase in productivity growth is thought by many observers to be associated with the increased importance of information technology (IT), a hypothesis often referred to as the "New Economy" view.

Whether rapid productivity growth will continue has been the subject of much debate. And the debate has intensified in the last six months, with the sharp decline in the tech-heavy NASDAQ index and the relatively slow growth of the economy. In this *Economic Letter*, I will document the sources of the increased productivity growth in the second half of the 1990s and the evidence for the New Economy and then provide a discussion of the prospects for growth over the next decade.

The New Economy

Economists are by no means agreed on the sources of the increase in productivity growth in the late 1990s. For example, Cornwell and Trehan (2000) discuss the arguments by one of the New Economy skeptics, Robert Gordon (2000). In this *Letter*, I begin by presenting the evidence from Oliner and Sichel (2000), whose study is more favorable to the New Economy view.

Oliner and Sichel find that labor productivity growth was 1.04 percentage points faster in the late 1990s than in the early 1990s. They decompose the increase into four parts (see Table 1).

Sources of Increased Labor Productivity Growth, 1996–1999 versus 1991–1995

Rise in labor productivity growth	1.04%
Contributions from	
Increased IT capital use	0.45
Increased efficiency of IT production	0.37
Increased efficiency of non-IT production	0.30
Other	–0.10

Source: Oliner and Sichel (2000) Table 5.
Note: Percentage points per year. Detail may not sum to total due to rounding.

First, the increased use of IT capital throughout the economy--computer hardware, software, and communications equipment--raised labor productivity growth by just under half a percentage point.

Second, the rate of improvement in the efficiency with which the economy produces IT capital increased substantially during the late 1990s. The rise in this growth rate, sometimes called multifactor productivity growth, contributed 0.37 percentage points to the increase in labor productivity growth. The remaining two components--increased efficiency outside the IT-producing sector and "Other"--together account for the remaining 0.2 percentage points.

The remarkable conclusion from this analysis is that the widespread adoption of IT in the United States, together with the increased efficiency in its production, accounts for about three-quarters of the rise in labor productivity growth, a quantity of about 0.8 percentage points.

The future of the New Economy

Whether or not the rapid productivity growth observed at the end of the 1990s will continue is an important and open question. Economic research suggests several insights into the answer.

The first relates to the business cycle. When the economy comes out of a recession and moves into a boom, productivity growth rates tend to rise. On the one hand, this works in favor of the view that the New Economy will continue: If productivity growth were mainly a cyclical phenomenon, one would expect it to have been strong during 1991-1995, as the economy came out of recession, and weak at the end of the 1990s, as the longest expansion in U.S. history matured; instead, of course, it surged at the end of the 1990s. On the other hand, Gordon (2000) provides an analysis in which business cycle effects account for as much as half a percentage point of growth at the end of the 1990s--and therefore about half of the total rise in labor productivity growth.

The flip side of this business cycle logic is that to the extent that the current expansion is coming to an end, one might expect productivity growth to be low in the near term. We may have to wait until the current cycle has run its course in order to measure the sustained impact of the New Economy.

Second, Jorgenson (2001) identifies one of the key elements of the rise in productivity growth as the acceleration in the rate of decline of semiconductor prices, which began in 1994 as the industry shifted from a three-year product cycle to a two-year cycle. This view is supported by the pattern of multifactor productivity growth in the semiconductor sector. According to Oliner and Sichel (2000), this growth rate was an astounding 30.7% per year between 1974 and 1990, 22.3% between 1990 and 1995, and then rose to an even more incredible 45.0% between 1996 and 1999. Jorgenson suggests that, based on industry projections, this faster decline in prices may continue for at least a decade.

Third, as has been noted by many commentators on the New Economy, including Paul David (1990), Brad DeLong (2001), and Robert Gordon (2000), the IT revolution is just the most recent in a series of revolutions. As the 19th century waned, a revolution based on the widespread adoption of electricity was already underway. Shortly thereafter, the internal combustion engine revolutionized transportation, on land as well as through the air. More generally, revolutions have been occurring throughout the 20th century in many other areas, including medicine, communications (radio and television), and so on. From this perspective, looking for the IT revolution to raise the trend growth rate may be misplaced. Rather, it may well be that the IT revolution is simply the most recent in a series of revolutions that allow the U.S. economy to sustain long-run economic growth.

Fourth, even if the IT revolution is somehow different from previous revolutions, it is not obvious that the New Economy should be characterized by a permanently higher growth rate. Theoretical models of endogenous growth based on the discovery of new knowledge (including, for example, work by Paul Romer (1990)), do not necessarily lead to this prediction. Rather, a permanent increase in labor productivity growth requires increasing the growth rate of the stock of knowledge. To the extent that the IT revolution is simply one or even several extraordinarily productive ideas, it still will increase only the *level* of income in the long-run, leaving the long-run *growth rate* unaffected. Of course, a very large increase in the level of income is itself a fantastic accomplishment, and, to the extent that this occurs over several years or even decades, the growth rate may be temporarily higher. However, this is different in a fundamental way from a permanent increase in the productivity growth rate, and this difference can be important for policy (for example, for projecting future budgetary problems associated with Social Security or Medicare).

Unfortunately, economists cannot say, at this point, what it takes to generate knowledge at a permanently faster rate and thereby raise the productivity growth rate permanently. For example, while the productivity of the economy in terms of goods and services generally increases over time (because of the discovery of new methods of production and higher-quality products), there is no reason to think this is the case for the productivity of the economy in creating new knowledge. It is certainly possible that the economy becomes increasingly better at producing new ideas--as Sir Isaac Newton said, "If I have seen further...it is by standing upon the shoulders of Giants." As just one example, it could be that some key ideas, perhaps including IT, give rise to a large number of subsequent discoveries. However, it is also possible that it becomes increasingly difficult to discover new ideas, as the most obvious ideas are discovered first.

Furthermore, it could be that after these discoveries are exhausted, an idea "famine" sets in, in which new discoveries are rare until the next Great Idea. Viewed from the start of the 21st century, with so many technical advances apparently on the horizon, this seems like an extremely remote possibility, but it nicely illustrates a fundamental ignorance about the nature of generating knowledge that should surely be kept in mind.

Summary

In the last half of the 1990s, labor productivity growth returned to rates not sustained since the 1960s. The evidence suggests that a substantial portion of this increase is associated with the increased adoption of IT throughout the economy and with the increased efficiency with which IT is itself produced. Whether or not these higher growth rates can be sustained is an open question that will likely remain unanswered at least until the completion of another business cycle.

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